

Wilson (N.L.)

URIC ACID AS A FACTOR IN THE
PRODUCTION OF HAY FEVER.

BY

NORTON L. WILSON, M. D.,

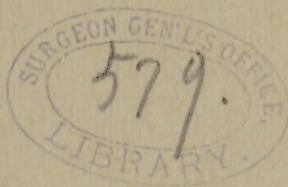
ELIZABETH, N. J.,

Ex-President of Union County, N. J., Medical Society ;
Laryngologist, Rhinologist, and Otologist, Elizabeth General
Hospital, etc.

REPRINTED FROM THE

New York Medical Journal

for December 26, 1896.



URIC ACID AS A FACTOR IN THE PRODUCTION OF HAY FEVER.*

BY NORTON L. WILSON, M. D.,

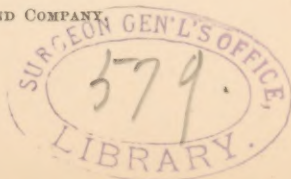
ELIZABETH, N. J.

EX-PRESIDENT OF UNION COUNTY, N. J., MEDICAL SOCIETY ;
LARYNGOLOGIST, RHINOLOGIST, AND OTOLOGIST, ELIZABETH GENERAL HOSPITAL,
ETC.

IN 1885 it was my privilege to present for your consideration the subject of tonsillitis, at which time I pointed out what appeared to me to be the cause of certain forms of this disease—viz., uric acid. The paper was thoroughly discussed, and some of the gentlemen present expressed themselves as never having heard of the theory before. To-day, I believe, this is a generally accepted theory. I further wish to present for your consideration the effect of uric acid not only upon the mucous membrane of the throat but upon the entire respiratory tract. Especially would I call your attention to uric acid as a very important factor in the production of hay fever and asthma. In 1892, while in conversation with a medical friend, I was induced to

* Read before the meeting of the District Medical Society of the County of Union, held in Plainfield, N. J., October 14, 1896.

COPYRIGHT, 1896, BY D. APPLETON AND COMPANY



purchase a book entitled the *Relation of Alimentation and Disease*. This book contains a chapter on asthma, its cause, pathology, and treatment. The chapter begins thus:

“All heavy horses are hogs. Heavy horses do not know when they have eaten enough. Heaves in horses corresponds to or is the same kind of disease in them that asthma is in man. All asthmatic people are unhealthy feeders and overeaters. They have a craving to keep the stomach full.”

This and many other similar expressions I read to my asthmatic patients, and almost without exception they expressed themselves in very forcible language as to the idiocy of the author of that chapter. Some of them admitted, however, that their attacks came on shortly after eating, and others said they were small eaters; and in some instances I knew this to be true. The author of that book goes on to say that “asthmatics are all dyspeptics of an especial type. They are all flatulent with carbonic-acid gas. Their stomachs are full of fermenting products. This special type of dyspepsia always develops a ‘gravelly diathesis.’”

Although I do not accept the teaching of this author or agree with him in his mode of treatment, I must, however, acknowledge that my first insight as to the cause of the disease, or rather one of the important factors in the production of hay fever and asthma, came from the perusal of that book. I have constantly kept in mind the thought that the respiratory mucous membrane was in some way or other irritated by uric acid. I not infrequently see a peculiar reddened and glazed appearance of the mucous membrane of the pharynx,

and often an œdematous soft palate and pillars of the fauces, with dilated and tortuous blood-vessels, which, after exhausting all other methods of treatment without success, will immediately clear up under salicylate of sodium.

The exact mode of production of uric acid in the body is still a matter of uncertainty, but, according to the majority of workers in this field, it is undoubtedly associated with nitrogenous metabolism, and the acid represents an imperfectly oxidized form of nitrogenous material. The final destination of uric acid is its conversion into urea, but from lack of perfect oxidation in the tissues this process is checked.

I determined to examine the urine, the blood, and the sputum of these patients and see if it was not due to excess of uric acid within the system. From the sputum I gained but little knowledge, because it was sometimes the secretion from the upper pharynx, sometimes from the bronchial tubes, and always more or less mixed with saliva. From the blood I gained this fact, that when the patients suffered most the blood was the most strongly alkaline (at which time it is richest in uric acid). I found the urine in some cases loaded with uric acid or urates, and in others it contained but little. I worked along this line, and it was uphill work, for many times when I supposed I had established this theory to my entire satisfaction I was met by some obstacle which almost annihilated my pet theory. Occasionally, however, I would see something which would give me fresh courage, and to-day I feel confident that uric acid is a potent factor in the production of hay fever and asthma. Of course, I allude to the asthma following hay fever. In reading Dr. Haig's book on uric acid I was

led to see why so many of my cases did badly on salicylate of sodium. He does not mention asthma as being due to uric-acid diathesis, but I think I can establish that fact, and he will help me do it by showing me errors in the administration of certain drugs. He has shown that quinine, in small doses, squeezes uric acid out of the spleen, thus producing uric acidæmia, while a larger dose—six to fifteen grains of the sulphate—will have the action of a sulphate, which clears the blood of uric acid and thus benefits these cases. I have frequently benefited asthmatics by ten grains of quinine, and I know this to be the basis of a popular “quack cure.”

He has shown that opium, cocaine, antipyrine, caffeine, strychnine, acids, iron, lead, lithia, manganese, calcium chloride, acid phosphate of sodium, some sulphates, chlorides, mercury, the nitrites, and some hypsulphites, either directly or indirectly raise the acidity of the blood or form insoluble compounds with uric acid. All these substances diminish the excretion of uric acid and bring about its retention and accumulation in the body. They drive the urates out of the circulation into the joints and fibrous tissues, also into the liver, spleen, and other organs.

Acidity of urine bears a fairly constant relation to urea, both tending to rise and fall together, and the relation given by Haig (one of acidity to 6.6 of urea) is very constant. “Whatever raises urea raises acidity, and *vice versa*. On the other hand, the alkalies (except lithia), phosphate of sodium, and compounds of salicylic acid, increase the excretion of uric acid in the urine, and for a time also increase the amount of it in the blood by raising the alkalinity of that fluid.” If these state-

ments are correct—and I have no reason to doubt them, as they agree with some observations made by myself—I should at least be able to make some impression upon my hay-fever patients, if, as I have stated, uric acid is a factor in its production. Since Bostock first described the affection, in 1819, it has been written upon largely by English and American authors, and I think it is pretty well established that three important factors are essential for the production of the disease:

1. The predisposing constitutional condition.
2. An external irritant.
3. A pathological condition of the nasal mucous membrane.

The predisposing constitutional condition is a neurosis, and who can say that this condition of the nervous system is not due to irritation by uric acid? It is a recognized fact that neurasthenia and lithæmia go hand in hand.

The second factor is an external irritant. I care not whether this be the emanation from certain plants, dust, odors, pollen, or any other mechanical irritant, my experience with mucous membranes has shown me that uric acid is a very important irritant, and I can see no reason why it should not act as such in autumnal catarrh.

The third factor is a pathological condition of the nasal mucous membrane. This may or may not be the result of irritation, and, so far as I can see, the uric-acid theory combines all three of these factors, for it not only induces a neurosis, but acts as a local irritant, which brings about pathological changes of the nasal mucous membrane. It is not necessary for me to say anything about the symptoms of this peculiar disease,

as you are all familiar with them, but I can not but allude to the paroxysmal sneezing, which is very apt to be worse about 4 A. M., or just as the patient arises in the morning. In most of the text-books it is set down that the sneezing is due to irritating dust or pollen grains. This I must deny, inasmuch as there is no dust or pollen grains in the bedchamber at that hour in the morning. In my opinion it is due to the neurotic tendency, and until I found that it occurred on dark or rainy days I ascribed it to the action of sunlight. I am now of the opinion that it is due to uric acid, since you will remember the blood at this hour is strongly alkaline, and there is more uric acid circulating in this fluid.

This brings me to the important part of this paper, Can we do anything to relieve our hay-fever patients? and before giving you my experience I want to quote Dr. Bishop, of Chicago, who has recently published a very interesting article on this very subject, and I may say truthfully that I was not aware when I wrote my previous remarks that others were working in the same field. This, however, encourages me to continue my observations, for I now feel that I am not alone in my belief.

Dr. Bishop says (in the July number of the *Laryngoscope*): "An excess of uric acid in the blood causes hay fever, or nervous catarrh. Attacks can be stopped by precipitating the excess of uric acid from the blood by rendering the latter less alkaline with an acid treatment." He, too, refers to Haig, and has evidently absorbed some of the ideas which caught me. He goes on to say: "While pursuing the study of gout and allied diseases dependent upon lithæmia, I was struck with

the close analogy between the conditions present, with their local manifestations, and the various phenomena of hay fever. The theory that the paroxysms of hay fever are due to a uric-acid toxæmia is not antagonistic to the present status of medical opinion or surgical treatment; but, on the contrary, explains questions that were inexplicable before. The uric-acid hypothesis explains why some persons suffer from attacks under certain conditions in winter as well as during the warm months."

The periodicity of hay fever has a counterpart in migraine, which comes once in every seven, ten, fourteen, or thirty days, for years or for life. But enough has been said to lay the base line of a treatment that has proved vastly more successful than any other thus far devised.

I must admit that I am not so sanguine as Dr. Bishop, and yet I want to lay before you, in an impartial manner, the results of my labors in this direction. You will remember a few years ago several eminent rhinologists, chief among whom was Dr. Daly, of Pittsburgh, and Dr. Roe, of Rochester, advocated the theory that it was "a local chronic disease, upon which the exciting cause acts with effect." They had in their minds, however, that the exciting cause came from without and not from within. I have cured some cases by removal of hypertrophies, spurs, polypi, etc., but I am satisfied they would still have their hay fever had I not made some change in their diet. This is the age when the medical profession at large is recognizing lithæmia, not only by swollen and painful joints, but by disease of the eye, the ear, the throat, the heart, the spleen, the liver, the gastro-intestinal tract, and, in

fact, almost every organ in the body will show evidences of uric-acid poisoning.

Just as the dermatologist often recognizes eczema as an expression of uric acid, so do I recognize hay fever as a lithæmic condition. If you will consult the appended table you will see that ten out of the eighteen cases had eczema in some form or other. If uric acid is the important factor in the production of hay fever and asthma, why is it that it usually makes its appearance about the middle of August, especially when most people eat but little meat during the summer? In health about five to eight grains of uric acid are secreted every twenty-four hours, and it is readily soluble in the blood, which is slightly alkaline. If there is increased formation of this acid no harm results so long as it is promptly eliminated and the ratio between it and the urea is not disturbed. Anything which will produce a low nutrition will produce uric acidæmia. About the middle of August you will find a marked change in the weather, when it is usually cooler and often damp for a day or two. Invariably, as soon as this change comes you will find the hay-fever symptoms begin. I have records of the weather for the past six years, and you can almost to a certainty pick out the date of attack by the drop in temperature. This year it was about the 8th of August, and again on the 14th, when the highest temperature was 74° and the weather cloudy. The table shows that my first cases this year began on the 10th, and six of them on the 15th.

The sudden drop in temperature diminishes perspiration, raises acidity, freeing the blood from uric acid and driving it into the tissues. In two days the temperature suddenly goes up, and then you have a uric

acidæmia which irritates the already exhausted nervous system and mucous membranes. Nutritive disturbances are brought about by overdrinking, especially when combined with deficient muscular exercise. Once irritated, the respiratory tract is kept in a constant state of irritation until the uric acid is driven from the blood by the onset of cold weather.

I do not mean to say that every case of uric-acid diathesis is a hay-fever subject, any more than I would say every such case had eczema, but I do mean to say that there is a very close relationship between uric acid and hay fever, and I do say that every patient having a neurasthenic tendency, if you please, and a pathological mucous membrane of the respiratory tract is irritated by uric acid, and thus far my observations have led me to suspect it in every case of periodic hyperæsthetic rhinitis. In the treatment of these cases the greatest care must be exercised. You must ever keep in mind that alkalies, salicylate, etc., produce a uric acidæmia so long as there is an increase of uric acid within the system. During the attack they must be used with care and in small doses. I have certainly increased the severity of an attack by giving ten grains of salicylate of sodium three times a day. During the attack it is better to free the blood from uric acid by the administration of an acid. Aromatic sulphuric acid or phosphoric acid acts very well. After freeing the blood, gradually extract the uric acid from the tissues by two- or three-grain doses of salicylate of sodium (given three times a day), cut off the acid-producing foods, such as meat, beer, wine, cider, lemonade, etc. Keep your patient's nervous system in the best possible condition by proper feeding, hygienic measures, and nerve

tonics, if necessary. See that no polypi, spurs, or hypertrophies exist in the nostrils. Begin a crusade against uric acid six weeks or even two months before the time of attack.

For the local relief, I have found menthol and camphor in liquid albolene, very gently sprayed into the nostrils, effectual in some cases. There are cases, however, which are apparently irritated by this solution, and for these I have found, if I would contract the tissue with a six- or ten-per-cent. solution of cocaine, and then gently coat the turbinate with a thin film of flexible collodion, they would experience relief. For the itching and irritation of the conjunctiva, hot water or yellow ointment rubbed into the conjunctiva will afford relief.

I can not close this paper without expressing my belief of the use of lithia. For the past three years I have failed to see a case of uric-acid diathesis benefited which I could ascribe to the action of lithia. In other words, the amount of water which these patients are obliged to take is, in my opinion, the factor for good, and not the lithia. Haig goes so far as to say that "lithia is a good solvent of uric acid in the test-tube, but in the body not only is it a poor solvent of that acid, but it actually combines with the phosphates in the blood and prevents its action on uric acid, so that the fact is lithia retards rather than increases its excretion."

I have hinted at rather than given any definite plan of treatment, and hope you will next season be able to give me the benefit of your experience. I think I can truthfully say that every patient on the list has received some benefit so far as the hay fever goes. This can not

NAME.	Asthmatic.	Acute articular rheumatism.	Rheumatic pains in joints or muscles.	Eczema.	Time of sneezing.	Pathological conditions in nose.	Do you have attacks in summer only?	Date of attack this year.	Date of asthma this year.	Are you immune at sea or on the water?	Where are you free from hay fever?	Age when first attacked.	Are you much of a meat eater?	Do you have rose cold?	Has my treatment benefited your hay fever?	Has my treatment benefited your asthma?
Mr. C. E.	Yes.	No.	Yes.	Yes.	11 A. M.	Yes.	No.	Aug. 14.	Aug. 14.	No.	Don't know.	20 yrs.	Yes.	Yes.	Yes.	Yes.
Mr. H. S.	Yes.	No.	Yes.	Yes.	7 A. M.	Yes.	Yes.	Aug. 10.	Aug. 31.	No.	Don't know.	22 yrs.	Yes.	No.	Yes.	Yes.
Mr. A. M.	Yes.	7 yrs. old.	Yes.	Yes.	7 A. M.	Yes.	Yes.	Aug. 20.	Aug. 27.	No.	Adirondack; White Mts.	18 yrs.	Yes.	No.	Yes.	No.
Miss S.	No.	Yes.	Yes.	No.	6 A. M.	No.	Yes.	Aug. 25.	.....	No.	Don't know.	7 yrs.	Yes.	No.	Yes.	Yes.
Miss M.	Yes.	No.	Yes.	No.	4 A. M.	Yes.	Yes.	Aug. 15.	Aug. 20.	No.	Don't know.	10 yrs.	Yes.	No.	Yes.	*
Mr. F.	No.	No.	Yes.	Yes.	7 A. M.	Yes.	Yes.	Aug. 14.	.....	No.	Don't know.	10 yrs.	Yes.	No.	No.	
Master B.	No.	No.	Yes.	Yes.	9 A. M. and P. M.	No.	Yes.	Aug. 10.	.....	No.	Don't know.	7 yrs.	Yes.	Yes.	Yes.	
Miss P.	Yes.	No.	Yes.	No.	7 A. M. and P. M.	Yes.	No.	Aug. 15.	Aug. 25.	Don't know.	Don't know.	11 yrs.	No.	Yes.	Yes.	Yes.
Mrs. D.	Yes.	No.	Yes.	Yes.	5.30 A. M.	Yes.	Yes.	Aug. 15.	Aug. 22.	Don't know.	Don't know.	22 yrs.	Yes.	No.	Yes.	Yes.
Mrs. G. P.	Yes.	No.	Yes.	Yes.	4 and 7 A. M.	Yes.	No.	Aug. 15.	Sept., '95.	Don't know.	Don't know.	20 yrs.	Yes.	No.	Yes.	No.
Master D.	No.	No.	Yes.	No.	4 A. M.	Yes.	Yes.	Aug. 15.	.....	No.	Don't know.	4 yrs.	Yes.	Yes.	Yes.	Yes.
Mr. W. D.	Yes.	No.	Yes.	Yes.	Early morning.	Yes.	Yes.	None.	None.	No.	Don't know.	20 yrs.	Yes.	Yes.	Yes.	
W. T. (negro).	No.	No.	Yes.	No.	Early morning.	Yes.	Yes.	None.	None.	No.	Don't know.	5 yrs.	Yes.	No.	Yes.	
Mrs. E. M. W.	No.	No.	Yes.	Hives.	8 A. M.	Yes.	Yes.	Aug. 13.	.....	No.	Don't know.	30 yrs.	Yes.	No.	Yes.	
Mr. W. D.	No.	No.	Yes.	Yes.	7 A. M.	Yes.	Yes.	Aug. 14.	.....	Don't know.	Don't know.	20 yrs.	Twice daily.	No.	Yes.	
Mrs. W. S.	Yes.	No.	Yes.	No.	4 A. M.	Yes.	Yes.	Aug. 25.	Aug. 25.	Don't know.	Don't know.	48 yrs.	Once daily.	No.	Yes.	No.
W. A. C.	Yes.	No.	Yes.	Yes.	7 A. M.	Yes.	No.	Aug. 15.	June 20.	Don't know.	Don't know.	1 yr.	Yes.	No.	Yes.	Yes.
W. M. A.	No.	No.	Yes.	No.	8 A. M.	Yes.	No.	Aug. 20.	.....	No.	White Mts.; not free in Adirondack.	14 yrs.	Yes.	Yes.	Yes.	

* Did not carry out treatment.

be said of their asthmatic symptoms, however, as three of them suffered quite as much as in previous years, but I have seen enough of the treatment to encourage me to begin early next season, and I feel confident I can at least mitigate their symptoms.

The New York Medical Journal.

A WEEKLY REVIEW OF MEDICINE.

EDITED BY

FRANK P. FOSTER, M.D.

THE PHYSICIAN who would keep abreast with the advances in medical science must read a *live* weekly medical journal, in which scientific facts are presented in a clear manner; one for which the articles are written by men of learning, and by those who are good and accurate observers; a journal that is stripped of every feature irrelevant to medical science, and gives evidence of being carefully and conscientiously edited; one that bears upon every page the stamp of desire to elevate the standard of the profession of medicine. Such a journal fulfills its mission—that of educator—to the highest degree, for not only does it inform its readers of all that is new in theory and practice, but, by means of its correct editing, instructs them in the very important yet much-neglected art of expressing their thoughts and ideas in a clear and correct manner. Too much stress can not be laid upon this feature, so utterly ignored by the “average” medical periodical.

Without making invidious comparisons, it can be truthfully stated that no medical journal in this country occupies the place, in these particulars, that is held by THE NEW YORK MEDICAL JOURNAL. No other journal is edited with the care that is bestowed on this; none contains articles of such high scientific value, coming as they do from the pens of the brightest and most learned medical men of America. A glance at the list of contributors to any volume, or an examination of any issue of the JOURNAL, will attest the truth of these statements. It is a journal for the masses of the profession, for the country as well as for the city practitioner; it covers the entire range of medicine and surgery. A very important feature of the JOURNAL is the number and character of its illustrations, which are unequaled by those of any other journal in the world. They appear in frequent issues, whenever called for by the article which they accompany, and no expense is spared to make them of superior excellence.

Subscription price, \$5.00 per annum. Volumes begin in January and July.

PUBLISHED BY

D. APPLETON & CO., 72 Fifth Avenue, New York.

